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Remarks

Entry of the above-noted amendments, reconsideration of the application, and allowance of all claims pending are respectfully requested. By this amendment, claims 1-4, 6-13, 15, and 17-22 are amended, claim 5 is canceled, and claims 23-32 are added. These amendments to the claims constitute a bona fide attempt by applicants to advance prosecution of the application and obtain allowance of certain claims, and are in no way meant to acquiesce to the substance of the rejections. Support for the amendments can be found throughout the specification (e.g., page 5, line 18, to page 6, line 14; page 7, line 17, to page 8, line 11; page 8, lines 20-22; and page 9, lines 21-22), drawings (e.g., FIGS. 1-2), and claims and thus, no new matter has been added. Claims 1-4 and 6-32 are pending.

Claim Rejections - 35 U.S.C. §103

Claims 1-3, 11, 17, and 22 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kim (U.S. Patent Application No. 2001/0000930 by Kim). Claims 4-10, 12-14, and 18-20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kim in view of Cordova, et al. (U.S. Patent No. 5,546,482; "Cordova '482"). Claim 21 is rejected under 35 U.S.C. §103(a) as being unpatentable over Kim in view of Cordova, et al. (U.S. Patent No. 5,742,390; "Cordova '390"). Claims 15-16 are rejected under 35 U.S.C. §103(a) as being unpatentable over Cordova '482 in view of Kim. These rejections are respectfully, but most strenuously, traversed.

Applicants respectfully submit that the Office Action's citations to the applied references, with or without combination, assuming, *arguendo*, that the combination of the Office Action's citations to the applied references is proper, do not teach or suggest one or more elements of the claimed invention, as further discussed below.

For explanatory purposes, applicants discuss herein one or more differences between the applied references and the claimed invention with reference to one or more parts of the applied references. This discussion, however, is in no way meant to acquiesce in any characterization that one or more parts of the applied references correspond to the claimed invention.

Independent claim 1 presented herewith has been amended to incorporate a concept previously appearing in dependent claim 5, which has been canceled herein. Applicants therefore discuss the rejection of dependent claim 5 with respect to independent claim 1.

In addition, independent claim 1 presented herewith has been amended to incorporate a concept appearing in independent claim 15. Applicants therefore also discuss the rejection of independent claim 15 with respect to independent claim 1.

Applicants respectfully submit that the Office Action's citations to the applied references do not teach or suggest one or more elements of the claimed invention. A careful reading of the Office Action's citations to the applied references fails to teach or suggest, for example, the polymeric potting material that encapsulates the fiber optic sensing coil, wherein the polymeric potting material comprises the plurality of voids, as recited in applicants' independent claim 1 presented herewith.

Kim discloses a process for the extrusion of microcellular polymeric material onto data communications material such as wire and optical fiber. A blowing agent is employed to form a suspension of bubbles within a polymer melt. The resulting microcellular polymeric material is then extruded onto the wire as a crush resistant coating. Kim fails to disclose the polymeric potting material that encapsulates the fiber optic sensing coil. This point is even conceded by the Office Action (paragraph 2, page 3):

However, the reference is silent with respect to the polymeric material comprising potting compound encapsulating the sensor

fibers, the fiber sensors comprising a sensor fiber coil, the potting component encapsulating the sensor fiber coil,...

So, Kim fails to satisfy at least one of applicants' claim limitations.

The shortcomings of Kim relative to certain elements of the claimed invention have been discussed above. The Office Action proposes a combination of Kim with Cordova '482. However, Cordova '482 does not overcome the deficiency of Kim. Applicants respectfully submit that the proposed combination of Kim with Cordova '482 fails to provide the required configuration, assuming, *arguendo*, that the combination of Kim with Cordova '482 is proper.

With regard to Cordova '482, the Office Action states (paragraph 2, page 4):

Cordova, et al. teach an apparatus comprising a polymeric potting compound encapsulating sensor fibers, the fiber sensors comprise a sensor fiber coil, the polymeric potting compound encapsulates the sensor fiber coil.

Also regarding Cordova '482, the Office Action admits (paragraph 4, page 7) that:

However, the reference is silent with respect to the potting material comprising a plurality of voids and wherein upon contact with the fiber optic sensing coil, the voids compress to promote a decrease in a strain on the fiber optic sensing coil wherein the decrease in strain promotes a decrease in a bias error of the fiber optic sensing coil.

Notwithstanding these admitted deficiencies of Kim and Cordova '482, the Office Action states (paragraph 2, page 4):

[I]t would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Cordova et, al. by using voids taught by Kim in the potting compound.

The motivation for using the polymeric compound with voids as the potting compound in Cordova is to protect the fibers of the sensor coil from damage (see Kim para 0046, lines 1-6).

Applicants respectfully submit that when undertaking an inquiry into the obviousness of an invention, a determination must be made regarding whether, at the time the invention was

made, the invention would have been obvious to one of ordinary skill in the art to which the subject matter of the invention pertains. Applicants strenuously traverse the §103 rejections on the following bases:

(1) The justification in the Office Action for combining Kim and Cordova '482 does not identify any express teaching, suggestion, or incentive in the art for this combination;

(2) The justification in the Office Action for combining Kim and Cordova '482 is nothing more than hindsight reconstruction of the present invention, which is impermissible when formulating an obviousness rejection;

(3) The prior art as a whole must be considered when formulating an obviousness rejection, and since Kim is directed to a different problem than that addressed by the present invention, the invention cannot be obvious from a combination of Kim and Cordova '482; and

(4) The invention has important results and advantages not realized by the systems disclosed in Kim and Cordova '482.

First, the Office Action states (paragraph 2, page 4) as a justification to combine Cordova '482 and Kim:

The motivation for using the polymeric compound with voids as the potting component in Cordova is to protect the fibers of the sensor coil from damage (see Kim para 0046, lines 1-6).

This justification for combining Cordova '482 and Kim conspicuously fails to identify any express teaching, suggestion, or incentive in the art for making the combination. Applicants respectfully submit, upon review, that Cordova '482 and/or Kim fail to provide any express teaching, suggestion, or incentive.

It is well settled that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion that the combination be made. Either the Office Action must identify an express teaching, suggestion, or incentive in the art, or the Office Action must present a convincing line of reasoning as to why

one skilled in the art would have found the claimed invention to have been obvious. Since no express teaching or suggestion in the art has been identified, attention must be turned to the reasoning to determine whether it is convincing regarding whether the invention is obvious.

Second, in this regard, the justification is nothing more than hindsight restatement of the results of the present invention.

Further, since this justification is hindsight reconstruction of the results of the present invention, the Office Action's reasoning is actually using the present invention itself as a basis to combine Kim and Cordova '482. This violates the settled principle that a motivation to modify a reference cannot come from the invention itself.

Applicants respectfully submit that the claimed invention would not have been obvious, namely, no express teaching or suggestion in the documents for the combination has been identified, and further, the justification given in the Office Action for combining Kim and Cordova '482 is not convincing since it is nothing more than hindsight reconstruction of the present invention using pieces of the documents to fill the gaps.

Third, applicants respectfully submit that Kim when considered as a whole is not directed to the problem addressed by the present invention.

For example, potting the windings and layers of a fiber optic sensing coil within a polymeric potting material facilitates precision coil winding. The polymeric potting material holds together the windings and layers as a wound unit. The polymeric potting material encapsulates the fiber optic sensing coil holding the various windings and layers in place within the polymeric potting material. The type of polymeric potting material, as well as the quality/durability of the winding pattern, affects gyroscope performance significantly.

In contrast, the wire coating in Kim covers a wire with a crush resistant coating. Kim discloses a process for extrusion of the microcellular polymeric material onto the wire. Extrusion of a coating onto a wire is not directed at the problem of encapsulating a fiber optic sensing coil in a polymeric potting material to hold together windings and layers of the fiber optic sensing coil as a wound unit. Therefore, the present invention is directed to a significantly different problem than Kim. Kim, when considered as a whole, is not directed to the problem of the present invention, and therefore should not be combined with Cordova '482 in the manner set forth in the Office Action.

Fourth, the present invention, by encapsulating the fiber optic sensing coil in the polymeric potting material, offers significant advantages over Kim and Cordova '482. The addition of voids in a polymeric potting material for a fiber optic gyroscope promotes an increase in accuracy and a decrease in the rotation sensing bias error of the fiber optic gyroscope, as described in the specification (page, 9, line 21, to page 10, line 2):

In one example, the polymeric material 204 encapsulates the sensor fiber 202 for the fiber optic gyroscope. The compression of the voids 208 promotes a decrease in measurement bias errors of the fiber optic gyroscope. For example, the decrease in the magnitude of the stress, strain, stress gradient, and/or strain gradient applied by the polymeric material 204 to the sensor fiber 202 promotes an increase in accuracy and a decrease in the rotation sensing bias error of the fiber optic gyroscope. The compression of the voids 208 promotes a decrease in a Shupe coefficient of the fiber optic gyroscope.

Since it is well settled that an analysis of the obviousness of a claimed invention must include a consideration of the results achieved by the invention, this is yet another reason why the invention is not obvious in view of Kim and Cordova '482.

The Office Action's citations to Kim and Cordova '482 all fail to meet at least one of applicants' claimed features. For example, there is no teaching or suggestion in the Office

Action's citations to Kim or Cordova '482 that the polymeric potting material that encapsulates the fiber optic sensing coil comprises the plurality of voids.

Furthermore, the Office Action does not allege that the art of record provides any teaching, suggestion, or incentive for combining the citations to Kim and Cordova '482 to provide the claimed configuration.

For all the above reasons, independent claims 1, 15, and 17 presented herewith are believed neither anticipated nor obvious over the art of the record. The corresponding dependent claims are believed allowable for the same reasons as the base claims 1, 15, and 17 as well as for their own additional characterizations.

For example, a careful reading of the Office Action's citations to the applied references fails to teach or suggest wherein the plurality of voids comprise a plurality of hollow elastomeric microballons, wherein the plurality of hollow elastomeric microballons comprise thin walls that encapsulate a gas to allow for compression of the plurality of hollow elastomeric microballons, as recited in applicants' dependent claims 14, 23-25, 28, and 30 presented herewith.

Kim discloses employment of a blowing agent (e.g., a physical or chemical blowing agent) to form a suspension of bubbles within a polymer melt. Simply missing from the citation to Kim by the Office Action is any mention that the plurality of voids comprise a plurality of hollow elastomeric microballons that comprise thin walls which encapsulate a gas.

Withdrawal of the §103 rejections is therefore respectfully requested.

In addition, new claim 31 presented herewith is believed neither anticipated nor obvious over the art of the record, and its corresponding new dependent claim is believed allowable for the same reasons as the base claim 31, as well as for its own additional characterizations.

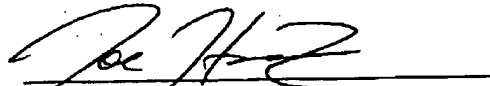
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For example, a careful reading of the Office Action's citations to the applied references fails to teach or suggest wherein the plurality of voids comprise a plurality of hollow elastomeric microballons, wherein the plurality of hollow elastomeric microballons comprise thin walls that encapsulate a gas to allow for compression of the plurality of hollow elastomeric microballons, as recited in applicants' dependent claim 32 presented herewith.

In view of the above amendments and remarks, allowance of all claims pending is respectfully requested. If a telephone conference would be of assistance in advancing the prosecution of this application, the Examiner is invited to call applicant's attorney Robert J. Brill, Reg. No. 36,760, and applicant's undersigned agent.

Respectfully submitted,



Joseph S. Hansasz
Agent for Applicants
Reg. No. 54,720

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PATTI & BRILL, LLC
Customer Number 32205